

Appl. No. 10/707,989
 Response dated April 11, 2005
 Reply to Office Action of Jan. 11, 2005

AMENDMENTS TO THE SPECIFICATION:

Please replace the equation in Paragraph 0237:

$$L_{g1} \geq - \frac{Q n T}{2 \pi \sqrt{\left(\frac{1}{2 \alpha_1}\right)^2 - \left(\frac{1}{\lambda_{308}}\right)^2}}$$

with the following rewritten equation:

$$L_{g1} \geq - \frac{Q n T}{2 \pi \sqrt{\left(\frac{1}{2 \alpha_1}\right)^2 - \left(\frac{1}{\lambda}\right)^2}}$$

Please replace Paragraph 0240 with the following rewritten paragraph:

-- λ : wavelength of the microwaves in the reaction vessel, and $\ln T$: the natural logarithm of T.--

Please replace Paragraph 0331 with the following rewritten paragraph:

--where λ = free space wavelength, and λ_{r15} ϵ_{r15} = relative dielectric constant of the rectangular antenna dielectric 15.--

Please replace the equation in Paragraph 0371:

$$L_{g1} \geq - \frac{Q n T}{2 \pi \sqrt{\left(\frac{1}{2 \alpha_1}\right)^2 - \left(\frac{1}{\lambda_{825}}\right)^2}}$$

with the following rewritten equation:

$$L_{g1} \geq - \frac{Q n T}{2 \pi \sqrt{\left(\frac{1}{2 \alpha_1}\right)^2 - \left(\frac{1}{\lambda_{308}}\right)^2}}$$

Please replace Paragraph 0372 with the following rewritten paragraph:

--where L_{g1} represents the length of the gas introduction nozzle 310a in the direction that the gas travels, α_1 represents the longer diameter of the gas introduction nozzle 310a in

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the direction perpendicular to the direction in which the gas travels, $\ln T$ represents the natural logarithm of T , and λ_{308} represents the wavelength of the microwaves in the processing chamber 308.--

Please replace Paragraph 0489 with the following rewritten paragraph:

~~--Furthermore, Table 1 below shows the relationship of the distance L_{H6} when H-branching or E-branching is combined with the arrangement position of the same phase or the arrangement position of the opposite phase. Here, the distance L_{H6} is set such that the phases of the microwaves in the rectangular antenna dielectric 634 in the central positions of the slots 630d of the two H-plane slot antennas 630 are matched to each other. Furthermore, a shape that allows a single mode operation is preferable, because interference of the microwaves in the H-plane slot antenna 630 or the like can be reduced. The length L_Y , for example, in the Y direction of the H-plane slot antenna 630 that allows a single mode operation can be derived from Equation 54 below.--~~

Please replace Paragraph 0511 with the following rewritten paragraph:

-- λ_{825} : wavelength of the microwaves in the rectangular processing chamber 825b,
and $\ln T$: the natural logarithm of T .--

Please replace Paragraph 0519 with the following rewritten paragraph:

--This application claims priority to Japanese Patent Application Nos. 2003-022073, 2002 2003-022074, 2002 2003-022075, 2002 2003-022076 and 2002 2003-022072. The entire disclosure of Japanese Patent Application Nos. 2002 2003-022073, 2002 2003-022074, 2002 2003-022075, 2002 2003-022076 and 2002 2003-022072 are hereby incorporated herein by reference.--

Please replace the Abstract with the following rewritten version:

--A plasma processing apparatus for performing plasma processing with respect to a sample in a reaction vessel includes a first dielectric that is connected to a microwave

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generating means unit, the first dielectric having a section that extends along a surface of a rectangular sample ~~to be processed that is rectangular~~, and that makes an electric field strength distribution of the microwaves generated from the microwave generating means unit substantially uniform along the surface of the sample ~~to be processed~~; a slot plate that is provided below the first dielectric and in which a plurality of first slots are formed, the slot plate retaining or further enhancing the uniformity of the electric field strength distribution of the microwaves in the first dielectric; a second dielectric that is provided below the slot plate and that retains or further enhances the uniformity of the electric field strength distribution of the microwaves supplied from the slot plate; and a processing means unit that processes the sample using a plasma generated in the reaction vessel by the microwaves.—